

Claims

I claim:

- 5 1. A storage device for storing trays, comprising:
 a first movable member; and
 a second movable member positioned opposite the first movable member, the
first and second movable members adapted to selectively vertically support at least one tray
therebetween.
- 10 2. The storage device of Claim 1, wherein each of the first and second movable
members engages the same tray.
3. The storage device of Claim 1, wherein the at least one tray comprises a
15 plurality of nested trays in a vertical column having an uppermost tray and a lowest tray.
4. The storage device of Claim 3, wherein the lowest tray of the plurality of
nested trays is supported by the first and second movable members.
- 20 5. The storage device of Claim 1, wherein the first and second movable members
include first and second rotatable members, respectively.
6. The storage device of Claim 5, wherein the first and second rotatable members
include teeth extending from their respective outer surfaces, the teeth engaging a lip on the
25 tray.

7. The storage device of Claim 6, wherein the at least one tray includes a stack of nested trays having an uppermost tray and a lowest tray, and wherein the lowest tray is supported by the teeth of the first and second rotatable members.

5 8. The storage device of Claim 6, wherein the teeth are configured with a tapered shape.

9. The storage device of Claim 1, further comprising at least one motor driving the first and second movable members.

10 10. The storage device of Claim 9, further comprising a gearbox coupling the at least one motor and the movable members.

11. The storage device of Claim 10, wherein the gearbox drives the first and
15 second movable members in opposite directions at substantially the same speed.

12. The storage device of Claim 1, wherein the first movable member is driven by a first motor, and the second movable member is driven by a second motor.

20 13. The storage device of Claim 12, further comprising a controller operable to drive the first motor and the second motor.

14. The storage device of Claim 1, wherein the first and second movable members are driven in opposite directions at substantially the same speed.

15. The storage device of Claim 1, wherein the first movable member includes a first outer frictional surface and the second movable member includes a second outer frictional surface, the first outer frictional surface frictionally engaging one side of the tray and the second outer frictional surface frictionally engaging an opposite side of the tray.

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16. The storage device of Claim 15, further comprising at least one transfer mechanism movable relative to the tray to selectively insert and remove the tray between the first and second movable members.

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17. The storage device of Claim 16, further comprising at least one suction device coupled to the transfer mechanism, the at least one suction device being engageable with a bottom surface of the tray to cling to the tray.

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18. The storage device of Claim 17, wherein the at least one suction device utilizes a source of vacuum to assist the at least one suction device in clinging onto the bottom surface of the tray.

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19. The storage device of Claim 1, wherein the first and second movable members are portions of at least one belt.

20. The storage device of Claim 19, wherein the at least one belt includes a third movable member and a fourth movable member positioned opposite the third movable member, and wherein the third and fourth movable members are adapted to selectively vertically support at least one tray therebetween.

21. The storage device of Claim 19, wherein the first movable member is a portion of a first belt, and the second movable member is a portion of a second belt.

22. The storage device of Claim 19, wherein the first movable member includes a first projection extending from the at least one belt and the second movable member includes a second projection extending from the at least one belt, and wherein the first and second projections engage a lip on the at least one tray to support the tray between the first and second projections.

23. The storage device of Claim 1, further comprising a transfer mechanism configured for transferring a tray from a transfer position to a storage position.

24. The storage device of Claim 23, further comprising a conveyor configured to transport the tray to and from the transfer position.

25. The storage device of Claim 24, wherein the transfer mechanism includes at least one tine movable through the conveyor, the at least one tine engaging the tray located at the transfer position and movable the tray to the storage position.

26. The storage device of Claim 25, further comprising at least one suction device coupled to the tine, the at least one suction device being engageable with a bottom surface of the tray to cling to the tray.

27. The storage device of Claim 26, wherein the at least one suction device utilizes a source of vacuum to assist the at least one suction device in clinging onto the bottom surface of the tray.

5 28. The storage device of Claim 23, wherein the transfer mechanism elevates the tray from the transfer position to the storage position.

29. The storage device of Claim 23, wherein the first and second movable members receive therebetween successive trays from the transfer mechanism, and wherein
10 the movable members store the successive trays in a nested configuration in the storage position.

30. The storage device of Claim 1, further comprising a shroud substantially covering the first movable member, the second movable member, and the at least one tray
15 supported by the movable members.

31. The storage device of Claim 1, wherein the at least one tray is a mail-handling tray.

20 32. The storage device of Claim 1, wherein the first and second movable members are wheels having a plurality of teeth extending therefrom to support the at least one tray.

33. The storage device of Claim 1, wherein the first and second movable members are wheels having respective outer frictional surfaces to support the at least one
25 tray.

34. A method for storing trays, comprising:
transporting a first tray to a transfer position;
vertically transferring the first tray from the transfer position to a storage
position; and
5 supporting the first tray in the storage position by two opposed movable
members.

35. The method of Claim 34, wherein vertically transferring the first tray includes:
elevating the first tray from the transfer position; and
10 moving the two opposed movable members to engage and elevate the first tray
to the storage position.

36. The method of Claim 34, further comprising:
transporting a second tray to the transfer position;
15 vertically transferring the second tray from the transfer position to the storage
position; and
nesting the first and second trays.

37. The method of Claim 36, further comprising:
20 supporting the second tray in the storage position by the two movable
members.

38. The method of Claim 36, wherein vertically transferring the second tray includes:

elevating the second tray from the transfer position; and

5 moving the two opposed movable members to engage and elevate the second tray to the storage position.

39. The method of Claim 36, wherein nesting the first and second trays includes nesting first and second mail-handling trays.